

**Policy options for Sustainable cost of Living while generating
Employment and Output in Kenya**

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ABSTRACT

This paper explores the role of macroeconomic factors in achieving sustainable cost of living while attaining economic growth at full employment in Kenya. In this paper, descriptive statistical method and multiple linear regression model was applied in data analysis. The data was collected from Kenya National Bureau of Statistics website and the World Bank website. The challenge of getting a uniform data based on equal time frame, was noted. The economic trend analysis of 20 years and regression analysis for 24 years respectively was used to make inference. Non-uniformity of years didn't compromise the quality of the report but rather presented an opportunity to study economic trends in Kenya. The study explored literature review on fiscal, monetary and technology as exogenous variable and their causal effect to economic growth and cost of living in Kenya. The study examined the GDP and inflation as key performance indicator to the cost of living, and further, the study examined a set of variables that influence the cost of living and finally, the study looked into economic policies that addresses rising cost of living in Kenya as demonstrated by the model and in the same breath, attaining stable economic growth at fully employment. Cost of living causal variables in the model included; exchange rate, employment, housing cost, transportation

cost and inflation. The cost of living variables can also be classified as economic growth variables, that is, they have direct influence on economic growth. The empirical findings of this study established that employment, housing cost measured in form of rent/mortgage cost financing, transport cost measured in form of fare/transportation cost of goods and services and inflation have direct influence on the cost of living and economic performance of the country.

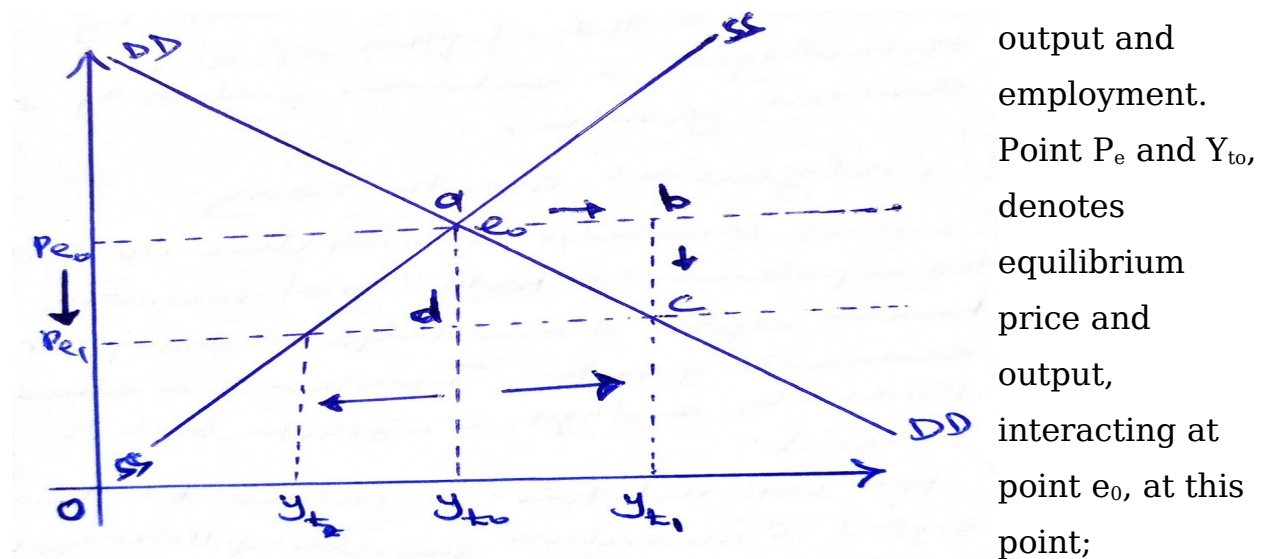
Key Words: Price, cost of living, welfare, inflation, employment and economic output

Introduction

The cost of living refers to amount of money needed to sustain a certain standard of living by affording expenses such as housing, food and healthcare, (Irving Fisher 1922). It is important in this study to understand how exchange rate, employment, housing cost, transportation cost and inflation impacts on the cost of living and economic growth overtime. The Gross Domestic Product is a measure of the total value of goods and services produced over a specific period of time within a country, (Simon Kuznets, 1930). Economic growth is an important indicator of a country's development, reflecting improvements in living standard and overall economic health of the nation.

Figure 1: Aggregate Demand and Supply

The diagram above shows the interplay between aggregate demand and supply in an economy. The diagram will aid in understanding the focus of the study, that is, attainment of stable cost of living while having growth in



aggregate demand equals aggregate supply. It is significant to note that the objective of this study is how to grow aggregate output from Y_{t0} to Y_{t1} while hypothetically maintaining the price at point P_{e0} . The stabilization of prices

at P_{e0} for over period t , will lead to a steady cost of living and hence, optimal social welfare for households.

Economic expansion is a crucial metric for assessment of the welfare of a country, (Adam Smith 1776). A growth in an economy suggests an increase in real GDP, this in essence refers to an increase in income, total output and total expenditure (J.M. Wooldridge and D.L.Baier, 2022). Economic growth means an increase in a country's ability to generate more goods and services (Palmer 2012). Economic growth further implies increase in human capital productivity over a given period of time (Rui Cunha Marques, Luis Pereira, and Jose Carlo Sa, 2023). Additional capital goods and advancement in technology leads to increased output (Ronald Berger, 2022).

LITERATRE REVIEW

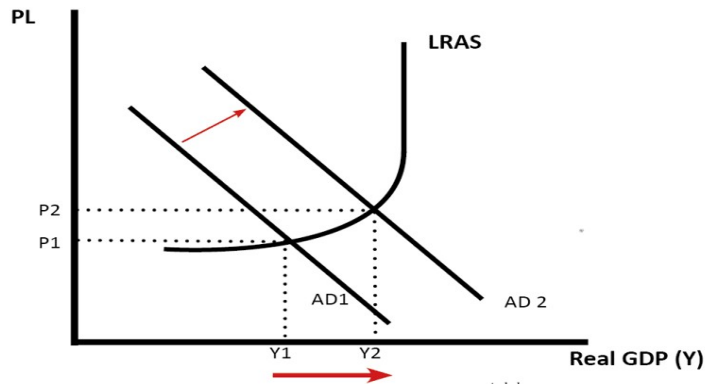
There exists a list of literature that explains the stabilization of the cost of living while pursuing the objective of GDP growth and employment. This paper presents the economic policies that a country can adopt in achieving a twin objective of welfare optimization through sustainable cost of living and attainment of economic growth for a given period of time t . It is significant to note that welfare maximization is only possible when income is equally distributed to all members of the society, (John Stuart Mill, 1848 and 1861). This is denoted by $W_t=f(Y_t)$. Objectively, economic growth policies converge towards providing, maintaining and ensuring continuity in welfare provision for the citizens through stable cost of living and having moderate economic growth. Welfare therefore is a mathematical function of the GDP. The change in welfare is subject to change in Y_t , where change in Y_t with respect to change in population, should be greater than zero, in other words, welfare cannot be zero at any given time. In this disposition, W_t denotes welfare and Y_t implies the GDP of a country for a given period t .

The guiding tenets to stable to social welfare includes; efficient distribution of goods and services to citizens and efficient allocation of factor inputs among the firms; labour and capital. The policy options that the Kenya government should consider in growing her economy will include: (i) fiscal policies, (ii) Monetary policy and (iii) Technological advancement.

Implementation of these policies will stimulate economic growth which will turn lead to sustainable cost of living to the population and hence, welfare optimization. The growth in the GDP in the long run, will cause a ripple effect to prices, the prices will tend to stabilize and become more predictive, the households can easily plan for budget spending, and spread their income over time t , and this then will lead to utility optimization.

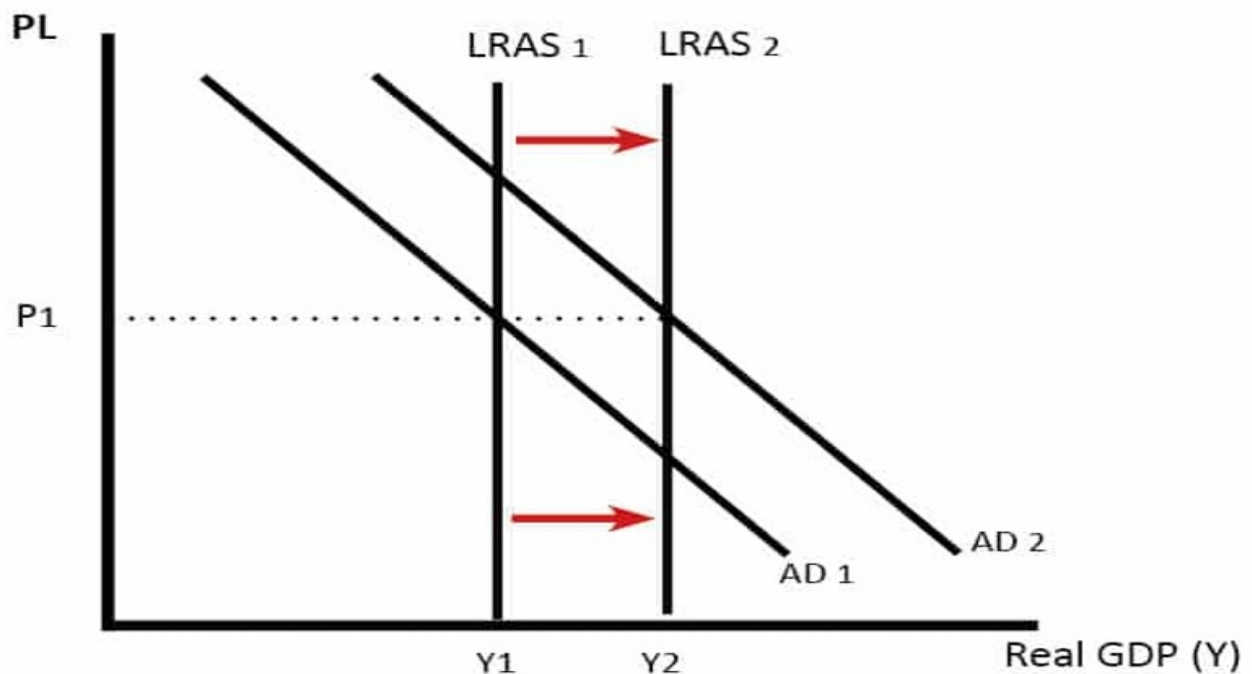
On fiscal policy, we will focus into a number of ways the fiscal policy approach stimulates economic growth and stabilizes the cost of living over time t . Fiscal policy targeting demand, will be examined in two perspectives: (i) Increasing government spending on infrastructure, healthcare and education, can boost demand in an economy. Higher government spending creates more jobs, this then leads to improved cost of living and hence, improved social welfare. It is however significant to note that when the economy is almost at full employment, further increase in aggregate demand will lead to inflation, (John Maynard Keynes, 1936). (ii) The lowering of government taxes either to the firms or to the households, will lead to increase in household disposal income, this will in turn lead to increase in aggregate demand for goods and services. The increase in aggregate demand is illustrated in the figure below.

Figure 2: An increase in Aggregate Demand



The figure above, illustrates increase in government spending stimulates demand from AD1 to AD2. (ii) The government can influence economic growth by focusing on the supply side of the economy, the objective here is to put mechanisms that improve production activities by the firms within an economy, for instance, investing in modern technology will lead to increased efficiency and productivity among firms.

Figure 3: Increase in Aggregate Supply and Demand in the Long Run



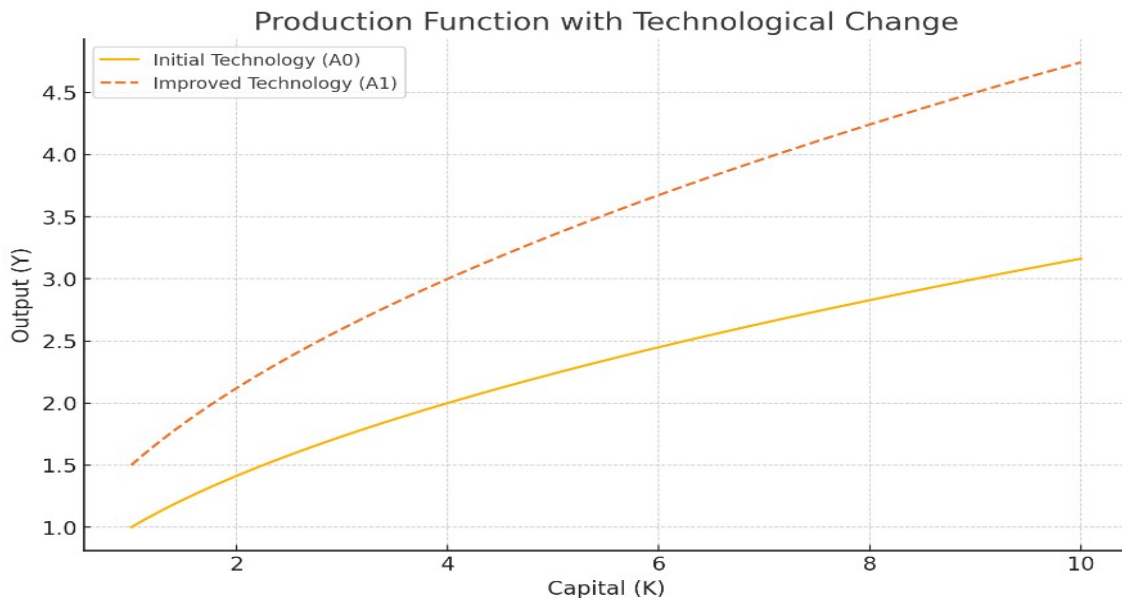
The increase in government expenditure on infrastructure, education, and healthcare, directly boosts demand from AD1 to AD2 and supply side of the economy in the long run from LRAS1 to LRAS2. Such investments create more jobs, increase income and stimulate consumption and investment by businesses and households. Tax cuts on the other hand, lowers the cost of production and enhances profits for businesses. The government investment in road infrastructure projects such as roads, bridges, and transportation services will boost efficiency in the economy by reducing transportation costs and time, facilitating better logistics, and improving overall productivity. The government should provide conducive environment for private investment by providing subsidies or grants to specific industries or sectors, the government can encourage private investment in areas deemed crucial for economic growth, such as technology, renewable energy, and manufacturing. Additionally, the government can offer tax incentives for businesses that invest in capital, research and development, this can spur additional private sector investment. The government can use expansionary fiscal policy to mitigate recession effects. And conversely, during the period of economic overheating, contractionary fiscal policy can be applied by government agency to cool down the economy. These counter-cyclical measures help stabilize economic fluctuations and create a more predictive environment for long term planning and investment. The government spending on education and vocational training will enhance the skills and productivity of the workforce, attracting better remunerations, leading to improved social welfare of the population. Government should invest in its health system, make health services accessible and affordable, the net effect, we will have a healthy and productive population, reducing economic losses from illness and absenteeism. The government should work on policies that address income inequality through social welfare programs and redistributive policies, this will lead to a more stable and inclusive economy. Higher equality boosts aggregate demand since lower -income households tend to spend a large part of their income on consumption. Lastly, the

government should enhance consumer and business confidence by making sure that the fiscal policies are clear and consistent. Uncertainty can lead to reduced economic activity as businesses and consumers may delay spending and making investment decisions.

The monetary policies play a key role in regulating economic growth and stabilization, (Milton Friedman, 1968). The Central bank can reduce the interest rates to make borrowing cheaper for businesses and consumers. This encourages investment in capital goods by businesses and increases consumer spending on big ticket items like homes and cars. During times of economic overheat and increasing inflation, the Central bank can then raise the interest rate, this will promote long term sustainable economic growth. Additionally, the Central bank can introduce or modify lending facilities to ensure that financial institutions have access to liquidity that they need to continue lending to businesses and households. This supports credit flow and economic activity. Through interventions in the foreign exchange market, Central bank can influence the value of the national currency. A lower exchange rate makes exports cheaper and more competitive abroad, stimulating economic growth through increased demand for domestically produced goods and services.

Technological advancement plays a crucial role in promoting economic growth. This analogy is supported by various economic theories and models that highlight how technology influences productivity, improves efficiency, and boosts overall economic performance for instance Solow-Swan Model, Endogenous growth theory, and Schumpeterian growth postulate that technological advancement stimulates economic growth through multiple channels, including increased productivity, innovation, and the creation of new industries and business models.

Figure 4: Technological Factor Influence on Production



The graph above shows the production function $Y=A.f(K,L)$. With technological advancement, the production function shifts upwards, leading to higher output without additional inputs. Technological progress in the long run breaks Solow belief of Steady State Growth intuition and thus technology is an enabler and driver of sustained economic growth, as it offsets diminishing returns to capital accumulation.

METHOD

The analysis of the literature review for achieving sustainable cost of living while having growth in output and employment was done using descriptive statistics and multiple regression approach. This will able us understand the factors that influence the cost of living while growing the economy.

Cost of living and economic growth will be analyzed in two contexts; (i) trend analysis and (ii) modeling of cost of living causal variables.

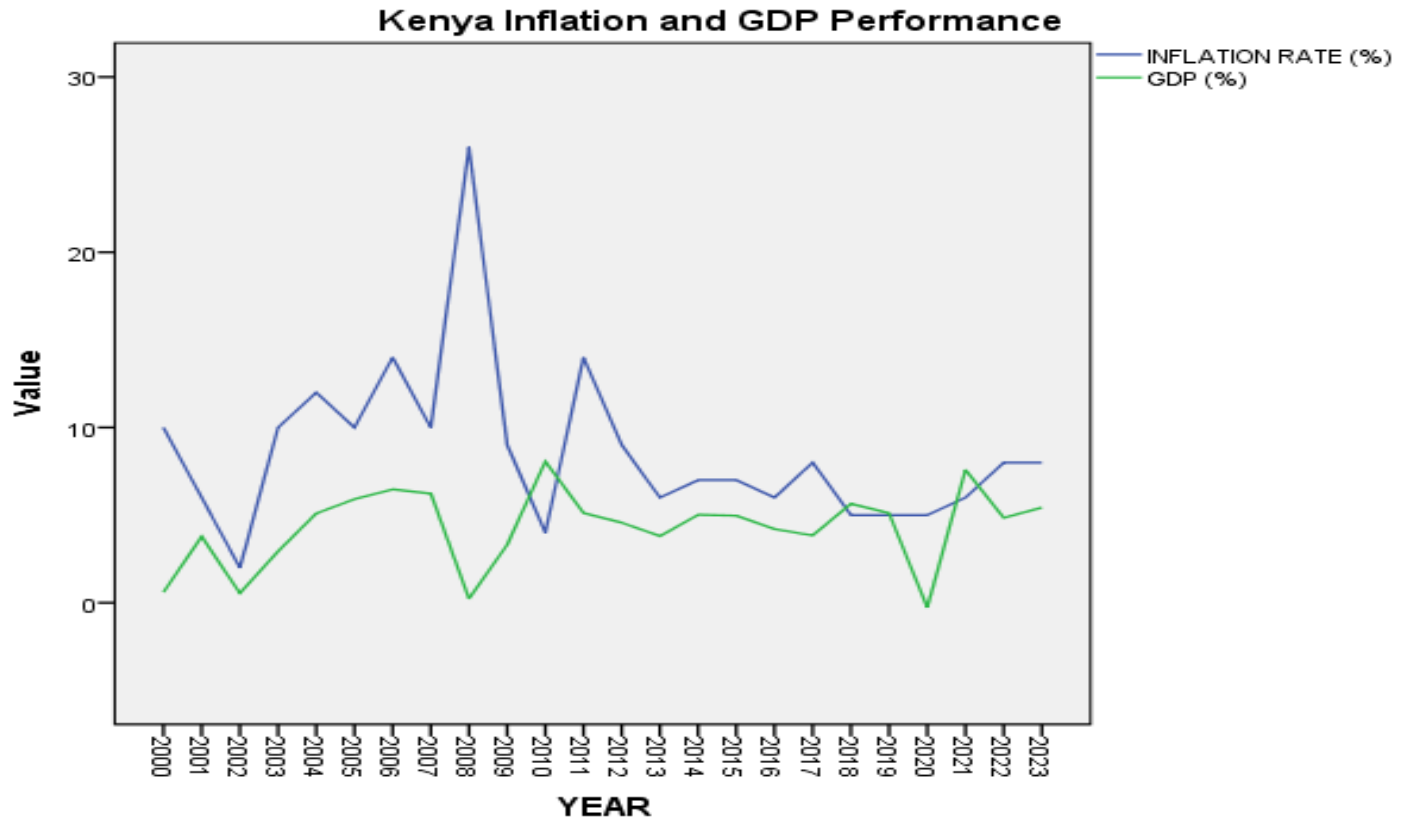
Table 01: Inflation and GDP trend analysis in Kenya

YEAR	INFLATION RATE (%)	GDP (%)
2000	9.98	0.6
2001	5.74	3.78
2002	1.96	0.55
2003	9.82	2.93
2004	11.62	5.1
2005	10.31	5.91
2006	14.45	6.47
2007	9.76	6.23
2008	26.24	0.23
2009	9.23	3.31
2010	3.96	8.06
2011	14.02	5.12
2012	9.38	4.57
2013	5.72	3.8
2014	6.88	5.02
2015	6.58	4.97
2016	6.3	4.21
2017	8.01	3.84
2018	4.69	5.65
2019	5.24	5.11
2020	5.41	-0.27
2021	6.11	7.59
2022	7.66	4.85
2023	7.67	5.43

Average	8.61	4.29
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The inflation grew at an average of 8.61% against GDP average growth rate of 4.29%. This indicates that the general price level of goods and services in the economy increased significantly faster than the overall economic growth, this signifies increased cost of living over the period. Figure 5 below shows the interplay between the inflation rate which is a measure of the cost of living and the GDP growth rate in Kenya, for equal period of years. The graphs were generated as per the data in table 1 above.

Figure 5: Graphical presentation of Inflation and GDP Kenya (2000-2023)



The blue curve represents inflation and the green curve represents the GDP. The rates are given in percentages (%). The trend analysis of the inflation is significant in understanding the cost of living in Kenya overtime. Inflation helps us in understanding changes in price levels of a broad basket of goods and services. Inflation index also measures consumer price index and producer price index. Kenya's economic growth has not been stable over time as indicated in figure 5 above. The inflation trend is consistently above the GDP curve as demonstrated in figure 5 above indicating rising cost of living at a lower rate of economic growth. This implies that real value of money decreases, reducing the purchasing power of households; households will be able to afford a few baskets of goods and services. This then leads to a decline in the standard of living.

Table 02: Cost of Living and Causal Factors in Kenya (2004 - 2023)

Year	Cost of Living Index	Inflation Rate (%)	Exchange Rate (KES/USD)	Employment Rate (%)	Housing Costs (Index)	Transportation Costs (KES)
2004	60	11.4	76.3	70.2	100	500
2005	63	10.3	74.6	69.5	102	520
2006	65	14.5	72.1	69	105	540
2007	67	9.8	69.4	68.7	108	560
2008	70	26.2	78.1	68.3	115	580
2009	72	10.5	75.6	68	118	600
2010	74	4.1	79.2	67.5	120	620
2011	77	14	88.8	67.2	123	650
2012	79	9.4	84.5	66.8	125	670
2013	81	5.7	86.1	66.5	128	690
2014	83	6.9	87.9	66.2	130	710
2015	85	6.6	102.3	66	135	730
2016	87	6.3	101.8	65.7	138	750
2017	89	8	103.4	65.5	140	770
2018	91	4.7	101.4	65.3	142	790
2019	93	5.2	102.7	65.1	145	810
2020	95	5.4	106.5	64.8	148	830
2021	97	6.1	109.1	64.5	150	850
2022	99	7.6	115	64.2	155	870
2023	100	9	120	61.3	160	900

Regression of cost of living against the causal variables as indicated in the table above, and

they include; exchange rate, employment, housing, transportation cost and inflation.

Table 03: Cost of Living Regression Output.

		Coefficients ^a									
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-61.636	17.335		-3.556	.003					
	Exchange Rate (KES/USD)	-.076	.025	-.094	-3.081	.008	.956	-.636	-.025	.068	14.686
	Employment Rate (%)	.844	.210	.143	4.011	.001	-.963	.731	.032	.050	19.911
	Housing Costs (Index)	.242	.083	.347	2.897	.012	.997	.612	.023	.004	225.320
	Transportation Costs (KES)	.090	.012	.882	7.418	.000	.999	.893	.059	.004	222.657
	Inflation Rate (%)	.002	.026	.001	.069	.946	-.515	.018	.001	.601	1.663

The regression model would be as follows:

Cost of

Living = $B_0 + B_1 \text{EmploymentRate} + B_2 \text{HousingCosts} + B_3 \text{TransportCosts} + B_4 \text{InflationRate} + E$

Cost of living=-61.636-

$0.076\text{ExchangeRate} + 0.844\text{EmploymentRate} + 0.242\text{HousingCosts} + 0.09\text{TransportationCosts} + 0.02\text{InflationRate}$. A one-unit increase in the exchange rate, leads to 0.076-unit decrease in the cost of living. The exchange rate is negative, denotes an inverse relationship between the exchange rate and the cost of living, this implies increase in exchange rate leads to depreciation of the Kenya Shilling against the US Dollar, it suggests that currency depreciation might have a minor deflationary effect. A weaker currency makes imports more expensive, negating the deflationary impact observed in the model. To reverse the adverse effect of weakening shilling in the model, the Central Bank of Kenya can deploy a number of monetary tools to mitigate weak shilling performance for instance, the Central Bank can buy its own currency in the foreign exchange market using its foreign currency reserves, this will increase demand for the local currency, thereby increasing its value. The Central bank can raise interest rates, higher interest rates would attract foreign local and foreign investors looking for better returns on investment in the market. Through open market operations, the central bank can buy or sell government securities in the open market to influence the money supply. Selling securities reduces money supply and this would significantly strengthen the Kenyan currency against the foreign currencies. The coefficient of $B=0.844$ indicates that for each 1%-point increase in the employment rate, the cost of living increases by 0.844 units, holding other variables in the model constant. Employment has a positive and direct relationship to the cost of living. The increase in employment according to the model tends to increase the cost of living, this is primarily so as employment increases, wage element increases on the side of firms who then pass the cost to the households in the form of increased prices and on the other hand, wage increase on the side of the household implies increased disposal income, meaning the households will have more money to spend on good and services. However, the empirical studies show that economic growth tends to be positively associated with

job creation. To achieve a balanced cost of living and economic growth, Kenya requires to invest in the right kinds of capital and infrastructure, fundamental structural change needed lies in transforming the key systems of energy, transport, industry, cities and rural economies. All these requires a combination of institutional change, standards and regulation, design and good policy. The housing cost coefficient, $B=0.242$, indicates that for each one-unit increase in the housing cost index, the cost of living increases by 0.242 units, assuming all other variables in the model are held constant. The positive coefficient suggests a direct relationship between housing cost and the cost of living, as housing cost rises, the cost of living increases. The p-value (Sig)=0.012 in the model, which is less than the common significance level of 0.05. The low p-value indicates that the relationship between housing costs and the cost of living is statistically significant, we can therefore confidently state that changes in housing costs are associated with changes in the cost of living, housing costs raises the cost of living by increasing the amount households spend on rent or mortgage payments. The rising housing cost also can be associated with higher utility costs. The Kenya government should explore policies that can mitigate rising cost of housing through the following policy mechanisms, (i) integrate rental housing into affordable housing framework to help bridge the gap between demand and supply, rectifying the existing mismatch, (ii) the government should stimulate the capital markets, this will increase stock of capital available for project development, while reducing reliance on traditional financing channels such as bank loans, (iii) create a robust system for continuously monitoring and evaluating the impact of affordable housing initiatives, through regular assessments can help identify areas for improvement, measure program effectiveness and ensure that government efforts are yielding the desired results, (iv) upgrade and improve the living condition of the slum areas for instance improved access to water, electricity, sewerage services, sanitation, access roads, (v) standardize mortgage practices and lending processes to increase efficiency in

affordable housing financing, creating administrative procedures can reduce costs, accelerate approvals and make homeownership more accessible and (vi) establish long term affordable housing scheme through Community Land Controls, by enabling communities to maintain control over their land, taking it out of speculative real estate markets and ensuring that affordability remains a permanent fixture in the housing landscape. The transport coefficient $B_3=0.09$, indicates that for each unit one-unit increase in transportation cost leads to 0.09-unit increase in the cost of living holding other variables in the model constant. The positive coefficient denotes a direct relationship between transport costs and the cost of living, as the transportation cost rises, the cost of living increases. The p-value < 0.001 , which is significantly lower than the common significance level of 0.05, this indicates that the relationship between transport costs and the cost of living is statistically significant. The government should explore the following policies to reduce the cost of transport; (i) infrastructure investment, this involves investing in efficient public transportation systems for instance buses and trains, can provide affordable alternative to private vehicle use, and improve road infrastructure, enhancing road quality and reducing congestion through better road design and maintenance can lower vehicle operating costs and travel time, (ii) subsidies and incentives, subsidizing public transportation to make it cheaper for users, encouraging its use over private cars, offering incentives for electric vehicles purchase and charging infrastructure development to reduce fuel dependency and costs, (iii) regulation and policies, price control , implement regulations to control the prices of essential transport services can help keep costs down, (iv) tax measures, reducing taxes on fuel and vehicle purchase to lower the overall cost of transportation and (v) promotion of alternative transport modes, for instance cycling and walking infrastructure, building and promoting bikes lanes and pedestrian paths can substantially reduce over reliance on motorized transport. The inflation coefficient in the regression model, $B_4=0.002$, this suggests that increase in the inflation rate has a very small

impact on the cost of living. The positive but not having a strong or reliable impact on the cost of living when other variables are considered. The p-value=0.946, which is significantly higher than the common significance level of 0.05. The higher value indicates that the relationship between inflation and the cost of living is not statistically significant in this model, this is due to presence of other stronger predictors in the model that explain the cost of living.

Conclusion

Overall, the analysis shows that on average, that Kenya has had inflation rate twice the level of economic growth overtime. The cost of living causal variables; exchange rate, employment, housing cost, transportation cost and inflation have direct influence on the cost of living and economic growth of a country. The fiscal and monetary policies can be applied by the country to achieve sustainable cost of living and moderate economic growth.

Policy Implications

Since an increase in the exchange rate, that is, depreciation of the local currency, slightly decreases the cost of living, maintaining a stable and favourable exchange rate can be beneficial. Implementing monetary policies that stabilize the exchange rate. This involves managing inflation and maintaining foreign exchange reserves.

According to the model, an increase in employment rate leads to increased cost of living, employment increases disposal income for the households and this would lead to increased demand for goods and services. While, full employment is desirable, policies should also focus on increasing the supply of essential goods and services to prevent excessive price increase. The government should invest in workforce development and ensuring that wage growth matches productivity growth.

Housing costs have a significant impact on the cost of living. High housing costs makes cost of living unaffordable for many. The government should provide subsidies for low income households, and promote policies that increase housing supply, such as zoning reforms and incentives for developers to build more affordable housing.

The government should invest in efficient and affordable public transportation systems to reduce transportation costs for residents. The government should encourage the use of eco-friendly and cost-effective transportation options through subsidies and infrastructure development.

The government should implement fiscal and monetary policies aimed at controlling inflation. This includes setting inflation targets, adjusting interest rates, and using fiscal tools to manage demand in the economy.

Suggestions for Further Research

An area that is not clear and worthy of further research offers an opportunity for the government to research and come up with economic policies to address the gap. From the above study, the identified gap is attainment of level of economic growth that is suitable and adjusts to sustainable cost of living, that is, does not cause distortion to economic performance.

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